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PATENT APPLICATION

ATTORNEY DOCKET NO. 100110043-1IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Heather N. Bean et al.

Confirmation No.: 4347

Application No.: 10/016,199

Examiner: James M. Hannett

Filing Date: 12/11/2001

Group Art Unit: 2622

Title: METHOD AND APPARATUS FOR MANAGING POWER IN A DEVICE AFTER A BATTERY FAILURE

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on 4/25/2006.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:☐ 1st Month
\$120☐ 2nd Month
\$450☐ 3rd Month
\$1020☐ 4th Month
\$1590☒ The extension fee has already been filed in this application.☐ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.Please charge to Deposit Account 08-2025 the sum of \$ 500. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.☐ I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to:
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Respectfully submitted,

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Docket No. 100110043-1

*PATENT***IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s): Heather N. Bean et al. Confirmation No: 4347
Serial No.: 10/016,199 Examiner: James M. Hannett
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APPEAL BRIEF**Introductory Comments**

Pursuant to the provisions of 37 C.F.R. § 41.30 *et seq.*, the Real Party in Interest hereby appeals to the Board of Patent Appeals and Interferences (hereinafter "the Board") from the claim rejections issued in the final Office action dated December 29, 2005. A notice of appeal was filed on the same day as this appeal brief.

Real Party In Interest

The entire interest in the present application was originally assigned to Hewlett-Packard Company (hereinafter "the Real Party in Interest"), as recorded at Reel 012881, Frame 0245. The entire interest in the present application has since been assigned to Hewlett-Packard Development Company, a Texas limited partnership and a wholly-owned subsidiary of Hewlett-Packard Company.

Related Appeals and Interferences

There are no prior or pending related appeals or interferences.

Status of Claims

Claims 44-58 are pending in the application.

Claims 44-58 have been finally rejected.

Claims 44-58 are being appealed.

Status of Amendments

No amendments have been filed subsequent to the final rejections.

Summary of Claimed Subject Matter

Independent claim 44 provides a method for managing power in a battery-operated device. (See, generally, Figs. 4A-4C; and page 6, line 18, through page 8, line 5.) In the method, the device is allowed to operate until a battery failure occurs. (Page 2, lines 24 and 25. See also page 6, lines 3-5.) A battery failure is a condition in which the battery's charge drops below a level required to operate the device. (Page 2, line 25, to page 3, line 2.) Upon an attempt to restart the device after the battery failure (operations 405 and 410 of Fig. 4A, proceeding to point A of Figs. 4A and 4B; and page 6, line 21, to page 7, line 2), the battery is determined to have insufficient charge to support further operation of the device (operations 435 and 440 of Fig. 4B; and page 7, lines 3-5). The device is then shut down properly using residual charge in the battery (operation 310 of Fig. 4B; and page 7, lines 5 and 6), as the battery has recovered sufficiently during a brief period between the battery failure and the attempt to restart the device to support shutting down the device properly (page 3, lines 2-5). Further operation of the device is disabled until the battery has been recharged or replaced. (Operation 450 of Fig. 4B; and page 7, lines 7-10. See also operations 435 and 440 of Fig. 4C; and page 7, line 20, to page 8,

line 2.)

Independent claim 49 provides a device, such as, for example, a digital camera 200. (See, generally, Fig. 2; and page 4, line 6, to page 5, line 12.) The device 200 includes a battery 265, a circuit 223 to detect a status of the battery, and control logic, such as a controller 205. (Fig. 2; and page 4, lines 8-12, 23 and 24). The controller 205 is configured to carry out a method involving several operations. In the method, the controller 205 allows the device 200 to operate until a failure of the battery 265 occurs. (Page 2, lines 24 and 25. See also page 6, lines 3-5.) A battery 265 failure is a condition in which the battery's charge drops below a level required to operate the device 200. (Page 2, line 25, to page 3, line 2.) Upon an attempt to restart the device 200 after the battery 265 failure (operations 405 and 410 of Fig. 4A, proceeding to point A of Figs. 4A and 4B; and page 6, line 21, to page 7, line 2), the controller 205 determines if the status of the battery 265 is unfavorable to continued operation of the device 200 (operations 435 and 440 of Fig. 4B; and page 7, lines 3-5). In this context, the status of the battery 265 is considered favorable whenever the battery 265 is capable of powering the device 200 for a period longer than a brief shutdown sequence performed whenever the device 200 is powered off; otherwise, the status of the battery is considered unfavorable. (Page 5, lines 8-12.) The device 200 is then shut down properly using residual charge in the battery 265 (operation 310 of Fig. 4B; and page 7, line 5 and 6), as the battery 265 has recovered sufficiently during a brief period between the battery 265 failure and the attempt to restart the device 200 to support shutting down the device 200 properly (page 3, lines 2-5). Further operation of the device 200 is disabled until the battery 265 has been recharged or replaced. (Operation 450 of Fig. 4B; and page 7, lines 7-10. See also operations 435 and 440 of Fig. 4C; and page 7, line 20, to page 8, line 2.)

Independent claim 56 provides a device 200 including a battery 265 (Fig. 2), means for detecting a status of the battery, and means for carrying out the method provided for by independent claim 49. The status-detecting means is identified with the battery status circuit 223 of Fig. 2. The battery status circuit 223 may measure the voltage of the battery 265. (Page 5, lines 4 and 5.) In another embodiment, the battery status circuit 223 may include an electromechanical mechanism that detects the removal and insertion of the battery 265. (Page 5, lines 5 and 6.)

The means for carrying out the method set forth in independent claim 56 is the controller 205 of Fig. 2. The controller 205 allows the device 200 to operate until a battery 265 failure occurs, as described above. (Page 2, lines 24 and 25. See also page 6, lines 3-5.) Upon an attempt to restart the device 200 after the battery 265 failure, the controller 205 determines via the battery status circuit 223 that the status of the battery 265 is unfavorable to continued operation of the device 200, as described above. (Operations 435 and 440 of Fig. 4B; page 7, lines 3-5; and page 5, lines 8-12.) In one embodiment, the controller 205 determines that a battery 265 failure previously occurred via a shutdown bit 245 of an internal memory 220 of the device 200. (Fig. 2; page 5, lines 13-17; and page 6, lines 3-7.) The controller 205 then shuts down the device properly using residual charge in the battery 265 (operation 310 of Fig. 4B; and page 7, line 5 and 6), as the battery 265 has recovered sufficiently during a brief period between the battery 265 failure and the attempt to restart the device 200 to support shutting down the device 200 properly (page 3, lines 2-5). In one embodiment, shutting down the device properly may involve removing power from all camera 200 components except the controller 205, placing control lines in a high-impedance state, removing charge from a strobe, and retracting a lens. (Page 5, lines 20-23.) Further operation of the device 200 is disabled until the battery 265 has been recharged or replaced. (Operation 450 of Fig. 4B; and page 7, lines 7-10. See also operations 435 and 440 of Fig. 4C; and page 7, line 20, to page 8, line 2.) In one embodiment, the controller 205 disables the device 200 by setting a disable bit 250 of the internal memory 220. (Fig. 2; and page 6, lines 7-17.)

Thus, independent claims 44, 49 and 56 describe devices in which usable battery life may be extended by allowing a device to operate until a battery failure actually occurs, instead of disabling device operation prior to battery failure. (Page 2, lines 24 and 25.)

Grounds of Rejection to Be Reviewed on Appeal

1. Claims 44-58 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,790,878 to Anderson et al. (hereinafter "Anderson") in view of U.S. Patent No. 6,687,839 to Tate et al. (hereinafter "Tate").

Argument

Outline

- I. Preliminary Discussion of the Anderson Reference
- II. Rejection of Claims 44-58 Under 35 U.S.C. § 103(a)
 - A. Claims 44, 49 and 56 are Allowable in View of Anderson Because Anderson Does Not Teach or Suggest Allowing a Device to Operate Until a Battery Failure Occurs, the Battery Failure Comprising a Condition in Which the Battery's Charge Drops Below a Level Required to Operate the Device
 - B. Claims 45-48, 50-55, 57 and 58 are Allowable in View of Anderson Because They Depend from Independent Claims 44, 49 and 56

I. Preliminary Discussion of the Anderson Reference

Anderson generally discloses "a system and method ... for recovering from a power failure within a digital camera device." (Column 2, lines 2-4.) Initially, a first-level interrupt handler sets a powerfail counter to zero. (Column 2, lines 9 and 10.) Also, interrupt service routines corresponding to various camera functions register with the interrupt handler to receive power failure notifications. (Column 2, lines 11-15.) A power manager then monitors a voltage sensor to detect a power failure within the digital camera. (Column 2, lines 19 and 20.) "After detecting a power failure in which the camera operating power is *less than a specified threshold value*, the power manager generates a powerfail interrupt. The central processing unit responsively performs a powerfail powerdown sequence to preserve image data contained within the digital camera at the time of the intervening power failure." (Column 2, lines 20-25; emphasis supplied.) "*The threshold value is typically selected to be incrementally higher than the minimum operating voltage* (to permit orderly shutdown of the camera.110 processes). (Column 6, lines 45-48; emphasis supplied.)

"After the power failure is remedied, the central processing unit performs a restart sequence to preserve any stored image data and to return the digital camera to a normal operational mode." (Column 2, lines 31-34.) The first-level interrupt handler then increments the powerfail counter and notifies the registered interrupt service routines about the power failure restart and corresponding hardware reset. (Column 2, lines 34-39.) In addition, each critical process that requires completion without an intervening power failure may consult the powerfail counter both before and after execution to verify whether a power failure has occurred during the process. (Column 2, lines 50-58.) If so, the critical process may be repeated. (Column 2, lines 58-61.)

II. Rejection of Claims 44-58 Under 35 U.S.C. 103(a)

Claims 44-58 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Anderson and Tate. (Page 2 of the final Office action.) The rejection is traversed herein based on the arguments provided below.

A. Claims 44, 49 and 56 are Allowable in View of Anderson Because Anderson Does Not Teach or Suggest Allowing a Device to Operate Until a Battery Failure Occurs, the Battery Failure Comprising a Condition in Which the Battery's Charge Drops Below a Level Required to Operate the Device

The final Office action indicates that Anderson teaches "allowing the device to operate until a battery failure occurs, the battery failure comprising a condition in which the battery's charge drops below a level required to operate the device," as provided for in independent claim 44. More specifically, the final Office action alleges that "Anderson teaches on Column 6, lines 44-48 that the predetermined threshold voltage is set to a level incrementally higher than the minimum operating voltage to permit shutdown of the camera. Because the camera of Anderson ceases to work after the threshold voltage is reached, *the examiner views the threshold voltage discussed in Anderson to be the voltage level required to operate the device.*" (Page 3 of the final Office action; emphasis supplied.) The Office action rejects independent claims 49 and 56 under the same reasoning. (Pages 5 and 8 of the final Office action.)

The Real Party in Interest respectfully disagrees with this characterization of Anderson. Anderson teaches instead that the camera is *intentionally* shut down by entering a "powerfail powerdown sequence" once the voltage of a set of main batteries falls below a predetermined threshold value. (Column 6, lines 52-64.) As indicated above, this threshold value is "incrementally *higher than the minimum operating voltage,*" (column 6, lines 45-47; emphasis supplied). Further, Anderson states that the main batteries have failed "when their output voltage has *fallen below a minimum operational voltage level.*" (Column 4, line 66, to column 5, line 1; emphasis supplied.) Therefore, Anderson itself draws a clear distinction between the predetermined threshold value (the voltage at which Anderson intentionally shuts down the camera) and the minimum operating voltage (the voltage corresponding to a charge level required to *operate* the device, as employed in claims 44, 49 and 56), even though the final Office action attempts to equate the two. Thus, employing the terminology of Anderson, *the*

Anderson threshold voltage does not constitute battery failure, which in the present application is a condition in which the battery's charge drops below a level required to operate the device, as noted in claims 44, 49 and 56.

Thus, the Anderson camera is *not* allowed to operate until battery failure occurs, as defined in claims 44, 49 and 56, but instead performs a "powerfail powerdown sequence" to cease operation of the camera *prior* to failure of the main batteries. The distinction is significant, as claims 44, 49 and 56 provide devices in which usable battery life may be extended by allowing the devices to operate until a battery failure occurs (page 2, lines 24 and 25), instead of prematurely disabling device operation when the battery voltage drops to a predetermined level prior to failure, as set forth in Anderson. Therefore, Anderson does not teach or suggest this particular provision of claims 44, 49, and 56, and such indication is respectfully requested.

Therefore, based on at least the foregoing reasons, the Real Party in Interest respectfully contends that claims 44, 49 and 56 are allowable in view of Anderson and Tate, and such indication is respectfully requested.

B. Claims 45-48, 50-55, 57 and 58 are Allowable in View of Anderson Because They Depend from Independent Claims 44, 49 and 56

Claims 45-48 depend from independent claim 1, claims 50-55 depend from independent claim 49, and claims 57 and 58 depend from independent claim 56, thus incorporating the provisions of their respective independent claims. Thus, the Real Party in Interest respectfully asserts that claims 45-48, 50-55, 57 and 58 are allowable for at least the same reasons provided above in support of independent claims 44, 49 and 56, and such indication is respectfully requested.

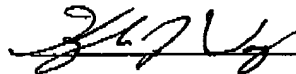
Conclusion

In light of the foregoing remarks, the Real Party in Interest submits to the Board that the final rejection of claims 44-58 is erroneous, and respectfully requests its reversal.

The Office is hereby authorized to charge Deposit Account No. 08-2025 the requisite fee for this appeal brief (37 C.F.R. 41.20(b)(2)), its associated notice of appeal (37 C.F.R. 41.20(b)(1)), and for a one-month extension of time (37 C.F.R. 1.17(a)(1)). The Real Party in Interest believes that no additional fees are due with respect to this filing. However, should the Office determine that additional fees are necessary, the Office is hereby authorized to charge Deposit Account No. 08-2025.

Respectfully submitted,

Date: 4/25/06



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Claims Appendix

The following is a list of claims involved in this appeal:

44. A method for managing power in a battery-operated device, comprising:
- allowing the device to operate until a battery failure occurs, the battery failure comprising a condition in which the battery's charge drops below a level required to operate the device;
 - determining, upon an attempt to restart the device after the battery failure, that the battery has insufficient charge to support further operation of the device;
 - shutting down the device properly using residual charge in the battery, the battery having recovered sufficiently during a brief period between the battery failure and the attempt to restart the device to support shutting down the device properly; and
 - disabling further operation of the device until the battery has been recharged or replaced.
45. The method of claim 44, further comprising:
- starting up the device and ensuring the integrity of a file system in the device after the battery has been recharged or replaced.
46. The method of claim 45, wherein ensuring the integrity of a file system in the device comprises:
- detecting an incomplete file-allocation-table entry;
 - deleting the incomplete file-allocation-table entry; and
 - outputting an error message.
47. The method of claim 44, wherein the device comprises a digital camera.
48. The method of claim 47, wherein shutting down the device properly comprises retracting a lens of the digital camera.

49. A device, comprising:

a battery;

a circuit to detect a status of the battery, and

control logic configured to carry out a method comprising:

allowing the device to operate until a battery failure occurs, the battery failure comprising a condition in which the battery's charge drops below a level required to operate the device;

determining, upon an attempt to restart the device after the battery failure, that the status of the battery is unfavorable to continued operation of the device;

shutting down the device properly using residual charge in the battery, the battery having recovered sufficiently during a brief period between the battery failure and the attempt to restart the device to support shutting down the device properly; and

disabling further operation of the device until the battery has been recharged or replaced.

50. The device of claim 49, wherein the method further comprises starting up the device and ensuring the integrity of a file system in the device after the battery has been recharged or replaced.

51. The device of claim 50, wherein ensuring the integrity of a file system in the device comprises:

detecting an incomplete file-allocation-table entry;

deleting the incomplete file-allocation-table entry; and

outputting an error message.

52. The device of claim 49, wherein the device comprises a digital camera.

53. The device of claim 52, wherein shutting down the device properly comprises retracting a lens of the digital camera.

54. The device of claim 49, wherein the control logic comprises a shutdown bit to detect when the device has experienced a battery failure.

55. The device of claim 49, wherein the control logic comprises a disable bit to prevent the device from being operated when the status of the battery is unfavorable.

56. A device, comprising:

a battery;

means for detecting a status of the battery; and

means for carrying out a method comprising:

allowing the device to operate until a battery failure occurs, the battery failure comprising a condition in which the battery's charge drops below a level required to operate the device;

determining, upon an attempt to restart the device after the battery failure, that the status of the battery is unfavorable to continued operation of the device;

shutting down the device properly using residual charge in the battery, the battery having recovered sufficiently during a brief period between the battery failure and the attempt to restart the device to support shutting down the device properly; and

disabling further operation of the device until the battery has been recharged or replaced.

57. The device of claim 56, wherein the method further comprises starting up the device and ensuring the integrity of a file system in the device after the battery has been recharged or replaced.

58. The device of claim 57, wherein ensuring the integrity of a file system in the device comprises:

detecting an incomplete file-allocation-table entry;

deleting the incomplete file-allocation-table entry; and

outputting an error message.

Evidence Appendix

No other evidence has been submitted by the Real Party in Interest or entered by the Examiner.

Related Proceedings Appendix

There are no prior or pending related appeals or interferences.